

although few empirical studies have been able to demonstrate natural selection, in chapter 13 the ability of natural selection to affect genetic systems is given considerable weight. Not only are traits selected but their inheritance (polygenic vs. single locus heritability) is also selected. A second example is chapter 2 in which it is assumed that a correlation between ovipositor length and habitat moisture demonstrates selection balance. I feel that correlation *does not* imply causation, the role of selection needing to be rigorously demonstrated, and thus these are areas where empirical work is needed.

Several of the chapters were enjoyable and thought provoking reading, including the chapter by D. Neumann on a slow growing intertidal midge (38–95 days) in which the adults are short lived (30 minutes to a few hours); the chapter by Valarie Brown which includes an amazing amount of data on the effect of plant succession on insect life cycle strategies; the review of variation in diapause induction by critical photoperiod as a function of latitude by Taylor and Spaulding; and the chapter by Lounibos and Machado-Allison describing parental care in mosquitos and demonstrating that rainfall is a selective pressure for maternal egg brooding.

The volume summarizes a broad range of research in insect life history evolution. I feel its strength is that it not only suggests areas for future research but I came away with many ideas of how such research needs to be conducted to provide contributions to this area. For this reason, I recommend it to researchers of insect life cycles.—*Lori Stevens, Department of Zoology, University of Vermont, Burlington, Vermont 05405-0086.*

J. New York Entomol. Soc. 97(2):249–250, 1989

DARWIN'S INSECTS

Darwin's Insects. Charles Darwin's Entomological Notes.—K. G. V. Smith (ed.). 1987. Bulletin of the British Museum (Natural History) 14(1):1–143. Natural History Museum Publications, Cromwell Road, London SW7 5BD, U.K. £25.

This publication is a careful, painstakingly prepared, account (essentially a catalogue) of Charles Darwin's insect collections of those of his specimens that have been located in the present-day entomological holdings or various institutions with the field notes made during the voyage of the British Navy's H.M.S. *Beagle* (1831–1835), on which vessel he served as naturalist. The text is organized in 10 sections, of which five record material housed in different institutions, all in various parts of The United Kingdom, most specimens being in the collections of the British Museum (Natural History). Almost one-half of the volume (67 pages) is taken up with Darwin's entomological notes from the *Beagle* voyage and their annotation. A list of scientific names is given that are formed from the surname Darwin, and used in the *Insecta*. Two indices are included: one, of geographical place names, and names of institutions, ships and persons cited in the text; and one of names of taxa. Illustrations provided are maps showing positions of collecting localities in South America, reproductions of plates illustrating specimens of new taxa that were based on Darwin-collected

material, and photographs of store-boxes, in several institutions, of Darwin's insect specimens.

Although Darwin has an excellent reputation for his contributions to entomology, the accolades are based on his ecological observations and hypotheses (significance of wing loss from adults; social behavior; pollination; other insect-plant relationships). He did not work on insect taxonomy or classification, and thus did not require or prepare extensive, working, entomological collections. The insect material gathered during his one great expedition, the voyage of the *Beagle*, was turned over to others for curation and study. This material was documented by perfunctory field notes recorded by Syms Covington, Darwin's assistant on the *Beagle*, who did much of the collecting. These notes were turned over to G. R. Waterhouse by Darwin, and, presently, the original manuscript is in the Entomological Library of the British Museum (Natural History) under the title "Copy of Darwin's notes in reference to Insects collected by him."

The bulk of the Darwin collection is a random accumulation of insects encountered during biotic and geologic explorations by the naturalist of the *Beagle* and his assistants. The collection was made solely for faunal documentation, in the least restrictive sense of that term. The collection was not used in any significant way by Darwin in developing his ideas about evolution.

The value of the collection is in its individual components: the numerous new taxa based on this material, that were described by Darwin's contemporaries at his behest and with his encouragement. From this material, entomologists gained early insights about the nature of portions of the insect fauna of the Southern Hemisphere visited by the *Beagle*.

Few new insights emerge from this publication because the volume is intended for documentation, only. The Editor did not offer any explicit goals or formal justification for preparing the publication. I was depressed, however, by the seedy appearance of the Darwin material illustrated by the photographs of the store-boxes in which specimens are housed. One would think that these institutions, especially Cambridge University, would be more mindful of such material, considering the eminence of the collector.

The justification for preparing this document resides, in fact, in the eminence of Charles Darwin. His outstanding contributions to biology make it worthwhile that all facets of his scientific life be documented as fully as possible. Kenneth Smith's publication elucidates one part of Darwin's scientific life. As a result of this work, future taxonomists who desire to locate specific parts of Darwin's collection will have a relatively easy task. Many taxa, however, were not accounted for. Perhaps this publication will provide the information and impetus necessary for curators with unrecognized Darwin material in their collections to recognize it and to make known their discoveries.

This publication should be in the better biological libraries of the world. However, I doubt that it has sufficient general value to be sought out by entomologists other than systematists, and only those in the latter group who are particularly interested in entomological history or in the entomological aspects of Charles Darwin. — *George E. Ball, Department of Entomology, University of Alberta.*